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Water and the internationally agreed development goals

Note by the Secretariat*

Summary

The present note is submitted pursuant to General Assembly resolution 64/198, in which the Assembly invited the President of the General Assembly to convene a high-level interactive dialogue of the sixty-fourth session of the General Assembly in New York on 22 March 2010, World Water Day, on the implementation of the International Decade for Action, "Water for Life", 2005-2015. The present note provides background information for Member States on water and the internationally agreed development goals, the theme of one of the panels of the interactive dialogue.

* The present note was prepared by the Department of Economic and Social Affairs, as the secretariat of UN-Water, the inter-agency mechanism designated by the United Nations System Chief Executives Board for Coordination, through its High-level Committee on Programmes, as the coordinating mechanism in the United Nations system for follow-up action in the area of water resources and sanitation.

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> "We will spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty, to which more than a billion of them are currently subjected. We are committed to making the right to development a reality for everyone and to freeing the entire human race from want".
>
> (United Nations Millennium Declaration, General Assembly resolution 55/2)

I. Introduction

1. Freshwater, like air, is one of the most essential of the Earth's elements for human life and civilization, as well as for fauna, flora and ecosystems. Freshwater is the subject of numerous global and regional agreements and internationally agreed development goals. The present note is intended as a basis for continuing high-level intergovernmental policy discussions on freshwater under the aegis of the United Nations, as part of the midterm review of the International Decade for Action, "Water for Life". The note provides a strategic overview of water in the context of global policy-setting, recognizing the multiple uses of water for people and the environment.

2. The present note also recognizes that there are multiple levels of governance over freshwater, including regional and transboundary, national and subnational governance, and recalls the importance of taking into account the full range of water challenges emerging from the Millennium Declaration and the World Summit for Sustainable Development, and reflected in the Millennium Development Goals, in policy deliberations.

3. The note makes the case for considering all of the internationally agreed development goals, including the Millennium Development Goals, from a water resources-based viewpoint. Availability and access to clean drinking water and sanitation is essential to the achievement of many of the internationally agreed development goals, including poverty eradication, overcoming hunger and ensuring health, not only those that explicitly mention water availability and access. The note should be read in conjunction with the complementary notes on water and climate change and water, peace and security (see A/64/692, A/64/693 and A/64/695), as well as other notes and reports devoted specifically to accelerating progress towards the Millennium Development Goals, such as the *Millennium Development Goals Report 2009*.

4. In the United Nations Millennium Declaration, adopted by the General Assembly in its resolution 52/2 of 8 September 2000, the then 189 Member States of the United Nations set a visionary framework for development in the twenty-first century, recognizing the respective responsibilities of the international community for solidarity as well as the responsibilities of individual sovereign nations. The Declaration addressed the following themes: values and principles; development and poverty; peace, security and disarmament; protecting our common environment; protecting the vulnerable; meeting the special needs of Africa; and strengthening the United Nations.

5. For purposes of most discussions on development policy and assistance, the Millennium Declaration has been summarized in the eight Millennium Development Goals, which have provided the Declaration with a convenient platform for dialogue

and accountability on development efforts and progress, particularly in the social area. The Declaration contains many other internationally agreed goals beyond what is explicitly contained in and measured by the Millennium Development Goals, particularly those related to global governance and a strengthened United Nations, the human right to development, and peace, security and disarmament, which are equally essential to human progress and well-being.

6. While an in-depth consideration of all dimensions of the Declaration is beyond the scope of this report, it is important to keep all of the above goals in mind in considering the international and national policies related to water, because water is related, either directly or indirectly, to most of them. To be meaningful, the Millennium Development Goals should always be considered jointly with the broader Millennium Declaration. The note therefore begins with a discussion of the Millennium Declaration, followed by an examination the eight Millennium Development Goals and how they relate to water. The note also includes a report on progress towards the Goals in the context of water at the mid-point of the "Water for Life" Decade and concluding recommendations, which are proposed as providing a way forward.

II. Internationally agreed development goals and freshwater issues

7. The Millennium Declaration set an ambitious agenda for improving the human condition by 2015. The Declaration and Millennium Development Goals committed the global community, including Governments worldwide, to a clear agenda for combating poverty, hunger, illiteracy, disease, discrimination against women and environmental degradation.

8. The most important specific freshwater goals in the Declaration were:

(a) To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies;

(b) To halve, by 2015, the proportion of the world's people whose income is less than one dollar a day and the proportion of people who suffer from hunger and, by the same date, to halve the proportion of people who are unable to reach or to afford safe drinking water.

Specifically in the area of water resources and sanitation, Heads of State pledged to reduce by half the proportion of people who are unable to reach, or to afford, safe drinking water by 2015 and to stop the unsustainable exploitation of water resources.

9. The additional goals adopted at the World Summit on Sustainable Development, held in Johannesburg in 2002, were aimed at developing integrated water resource management and water efficiency plans by 2005 and at halving the proportion of people who do not have access to basic sanitation by 2015.

10. The primary goal of the International Decade of Action "Water for Life", 2005-2015, is to promote efforts to fulfil international commitments made on water and water-related issues by 2015, to be in point of fact a decade of action. The decade 2005-2015 is the second international decade on water-related issues

organized by the United Nations, following the International Drinking Water Supply and Sanitation Decade, 1981-1990.

11. Regarding the call in the Millennium Declaration for the strengthening of the United Nations in 2004, the United Nations System Chief Executives Board for Coordination established, through its High-level Committee on Programmes, UN-Water, a United Nations system-wide mechanism in the area of freshwater aimed at achieving coherence and coordination in the water- and sanitation-related activities of the 27 agencies, departments and programmes of the United Nations system.

III. Progress towards the Millennium Development Goals

12. The Millennium Declaration set 2015 as the target date for achieving most of the Millennium Development Goals. The Goals established quantitative benchmarks to halve extreme poverty in all its forms. At present, with that date less than five years away, the world finds itself mired in an economic crisis that is unprecedented in its severity and global dimensions. Progress towards the goals is now threatened by sluggish, even negative, economic growth, diminished resources, fewer trade opportunities for the developing countries and possible reductions in aid flows from donor nations. At the same time, the effects of climate change are becoming increasingly apparent, with a potentially devastating impact on countries rich and poor. Today, more than ever, the commitment to building the global partnership embodied in the Millennium Declaration must guide our collective actions.

13. The *Millennium Development Goals Report 2009* portrayed the remarkable advances that many countries and regions had made before the economic landscape changed so radically in 2008. Those living in extreme poverty in the developing regions accounted for slightly more than a quarter of the developing world's population in 2005, compared to almost half in 1990.

14. Major accomplishments have also been made in education. In the developing world as a whole, enrolment in primary education reached 88 per cent in 2007, up from 83 per cent in 2000, and the most significant progress was in regions lagging the furthest behind. In sub-Saharan Africa and Southern Asia, enrolment increased by 15 percentage points and 11 percentage points, respectively, from 2000 to 2007.

15. Deaths of children under five declined steadily worldwide, to around 9 million in 2007, down from 12.6 million in 1990, despite population growth. Although child mortality rates remain highest in sub-Saharan Africa, recent survey data show remarkable improvements in key interventions that could yield major breakthroughs for children in that region in the years ahead.

16. Among these interventions are the distribution of insecticide-treated bed nets to reduce the toll of malaria — a major killer of children. As a result of "second chance" immunizations, dramatic progress is also being made in the fight against measles. At the global level, the world came together to achieve a 97 per cent reduction in the consumption of substances that deplete the Earth's protective ozone layer, setting a new precedent for international cooperation.

17. These accomplishments demonstrate that the Millennium Development Goals are within reach at the global level, even in very poor countries. The Goals must continue to provide a focus for our efforts, and the vision of a world without poverty

must not be lost, even in these difficult times: Efforts to provide productive and decent employment for all, including women and young people, must be revitalized. The share of women in paid employment outside the agricultural sector has increased only marginally over the years. And in Southern Asia, Northern Africa and Western Asia, employment opportunities for women remain extremely low.

18. The war against hunger must be embraced with renewed vigour, especially in the interests of our youngest citizens. In the countries hardest hit by the recent rise in food prices, we must implement measures to increase the availability of food and strengthen social policies that address the negative impact on the poor. Work must be intensified to ensure that all children attend school, especially those living in rural communities, and to eliminate inequalities in education based on gender and ethnicity, including among linguistic and religious minorities. The target of eliminating gender disparities in primary and secondary education by 2005 has already been missed.

19. Greater political will must be mustered to reduce maternal mortality, especially in sub-Saharan Africa and Southern Asia, where negligible progress has been made thus far. Rapid acceleration of progress is needed to bring improved sanitation to the 1.4 billion people who were doing without it in 2006, with all the attendant consequences for the health of their communities and the local environment. At the present rate of progress, the 2015 sanitation target will be missed.

20. Advances are most evident where targeted interventions have had an immediate effect, and where increased funding has translated into an expansion of programmes to deliver services and tools directly to those in need. This can be seen in the fight against malaria, the dramatic reduction in deaths resulting from measles, and in the coverage of antiretroviral treatment for HIV and AIDS, which increased tenfold over a five-year timespan. In contrast, progress has been more modest when it requires structural changes and strong political commitment to guarantee sufficient and sustained funding over a longer period of time.

21. This is likely the reason behind the poor performance of most countries in reducing maternal mortality and increasing access of the rural poor to improved sanitation facilities. Achieving the Millennium Development Goals will require the full integration of the development agenda into efforts to jumpstart growth and rebuild the global economy.

22. At the top of the agenda is the climate change problem, which will have to be regarded as an opportunity to develop more efficient green technologies and make the structural changes needed for sustainable growth. Achieving the Millennium Development Goals will also require targeting areas and population groups that have clearly been left behind — rural communities, the poorest households and ethnic minorities, all of whom will have a hand in shaping our common future.

23. Policymakers need to reaffirm their engagement to the broader Millennium Declaration, of which the Millennium Development Goals and its quantitative targets are an integral but not an exclusive part. The Declaration, committed the signatories, inter alia, to a range of values and principles in the area of human rights, including the right to development, dignity, equality, freedom, conserving nature, solidarity, democracy, peace, security and disarmament.

24. The focus on the quantitative targets should at no time detract from these qualitative aspects of development. The Millennium Declaration gives the Millennium Development Goals their context and meaning as well as their orientation towards ethical and holistic development. Realizing the ultimate aspirations of the Millennium Declaration for all people, including the billion most deprived, must remain the true focus of international and national development policy. The Goals and their targets, which primarily address the needs of the billion most deprived by 2015, need to be seen as milestones along the way rather than as finishing posts.

25. As 2015 rapidly approaches, it will be critical for policymakers to develop an alternative strategy for development that goes beyond the Millennium Development Goals and aims at realizing all aspects of the Millennium Declaration for all. What is required is a new discourse on development and new institutions which have human dignity, rights, security, ecological justice and intergenerational accountability at their core, and which put people and our planet Earth at the heart of development.

IV. Progress towards the water and sanitation goals

26. Much has happened since 2000 when the Millennium Declaration was issued: terrorism, war, market failures, immigration, climate change and the search for a new paradigm to address the inadequacies of the previous model, particularly following the financial crisis that started in 2008. Worldwide, only 27 per cent of the rural population enjoyed the convenience and substantial health benefits of having water piped into their homes or to their premises in 2006. Fifty per cent of rural dwellers relied on other improved drinking water sources, such as public taps, hand pumps, improved dug wells or springs. A small proportion of this population relied on rainwater.

27. While nearly one quarter (24 per cent) of the rural population obtain their drinking water from unimproved sources: surface water such as lakes, rivers, dams or from unprotected dug wells or springs, even using an improved water source is no guarantee that water is safe: when tested, the drinking water obtained from many improved sources has not met the microbiological standards set by the World Health Organization (WHO).

28. People living in urban areas of the developing world are more than twice as likely as those living in rural areas to have piped drinking water supplied to their premises. Disparities are especially evident in Latin America and the Caribbean region, which has the second lowest supply of improved drinking water of all rural areas. Only 73 per cent of the rural inhabitants in that region use an improved water source, compared to 97 per cent of urban dwellers. There are currently 1.1 billion people, or 18 per cent of the world's population, without access to safe drinking water. About 2.6 billion people, or 42 per cent of the total, lack access to basic sanitation.

29. The Millennium Development Goals call for halving "by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation". The Goal for safe drinking water on a global scale appears likely to be reached, in most regions, with the exception of sub-Saharan Africa. Between 1990 and 2006, 1.1 billion people gained access to safe drinking water.

30. The greatest access gains were achieved in Asia. In East Asia, water access increased from 71 per cent in 1990 to 78 per cent in 2004, just before the start of the Water Decade, and to 88 per cent in 2006. In South Asia, water access increased from 71 per cent in 1990 to 85 per cent in 2004 and to 83 per cent in 2006.

31. In sub-Saharan Africa, however, access grew minimally, from 49 per cent in 1990 to 56 per cent in 2004 to 58 per cent in 2006. Reaching the water access goal for sub-Saharan Africa, which would mean achieving 75 per cent water access by 2015, would require major national and international development efforts, including massive and steady investments.

32. It is estimated that an additional investment of $11.3 billion per year would be needed to achieve the Millennium Development Goals for drinking water and sanitation at the most basic levels.

33. From 1990 to 2006, 1.1 billion people in the developing world gained access to toilets, latrines and other forms of improved sanitation. An additional 1.4 billion people will require such facilities if the 2015 target is to be met. In 2006, 2.5 billion people worldwide were still unserved. The greatest challenge is in Southern Asia, where 580 million people are without improved sanitation.

34. From 2006 to 2015, the number of people currently using improved facilities in Southern Asia will have to double to meet the Millennium Development Goals on water and sanitation. Sub-Saharan Africa also faces steep challenges. The target is to provide improved sanitation to 63 per cent of the region's population — about 370 million more people than the estimated 242 million who had access to such facilities in 2006.

35. Despite having the lowest sanitation coverage in 1990, Southern Asia and sub-Saharan Africa have made notable progress. In Southern Asia, the population that uses an improved sanitation facility has more than doubled since 1990; in sub-Saharan Africa, it has increased by over 80 per cent. Defecating in open, often publicly accessible spaces is the last recourse for people without any form of sanitation, a practice that not only jeopardizes individual health and that of his or her family, but also those who live nearby — even if they themselves use improved facilities. In addition, seeking private areas in which to defecate can put the safety of girls and women at risk. Eighteen per cent of the world's population — 1.2 billion people — have no other option. The vast majority of these people (87 per cent) live in rural areas. In developing regions, more than one in three rural dwellers have no access to proper sanitary facilities. The one exception is Eastern Asia, where the practice is less common in rural than in urban areas.

36. Water, sanitation and hygiene education are crucial for poverty reduction and form the bedrock of a healthy, productive society. The work of the members and partners of UN-Water makes a significant contribution to reaching the Millennium Development Goals, especially through actions to halve the proportion of people without access to safe water and sanitation, which are specific targets within Goal 7. Without health and education, people remain trapped in the stranglehold of poverty and disease.

37. Below is an outline of how freshwater relates to each of the eight Millennium Development Goals.

Goal 1: Eradicate extreme poverty and hunger

By 2015, reduce by half the proportion of people living on less than a dollar a day. More than one billion people still subsist on less than $1 a day, with many regions of the world still falling short of achieving the Goal

38. The main indicators for progress towards this Goal are:

(a) Proportion of population living on less than $1 per day;

(b) Poverty gap ratio, which is the mean distance below the $1 a day poverty line;

(c) Share of the poorest quintile in national consumption.

39. According to the 2009 UN-Water *World Water Development Report*, problems of poverty are inextricably linked with those of water, its availability, proximity, quantity and quality. Improving the access of poor people to water has the potential to make a major contribution towards poverty eradication.

40. The amount of time spent on water collection greatly contributes to poverty. Water development projects provide convenient water supplies allowing people to efficiently look after the needs of their families for water, freeing up the rest of the day for earning much-needed cash or tending to agriculture. In addition, healthy people are better able than those suffering from water-related diseases, particularly worms, which rob their hosts of calories, to absorb the nutrients in food.

41. There are important side benefits that arise from the establishment of wells and pumps. Excess water is often used to nurture kitchen gardens, which provide a sustainable source of vegetables to vary people's diets. Development practitioners also advocate the use of composting latrines that produce a free, viable and sustainable alternative to expensive, and often polluting, fertilizers.

By 2015, reduce by half the proportion of people who suffer from hunger

42. According to the Food and Agriculture Organization of the United Nations (FAO), some 840 million people still suffer from undernourishment. This challenge is further amplified by the rapidly growing world population.

43. According to the *World Water Development Report*, a large number of undernourished people live in environmentally degraded rural areas and in urban slums. War and natural disasters, such as floods and droughts, are the major causes of undernourishment.

44. The main indicators for progress towards this Goal are:

(a) Prevalence of underweight children under five years of age;

(b) Proportion of population below the minimum level of dietary energy consumption.

45. In order to reduce the level of hunger worldwide, the World Water Assessment Programme identifies three water-related challenges: meeting basic needs; valuing water; and securing food supply. Additional documentation and evidence include the report of the Asian Development Bank on the Third World Water Forum, held in March 2003, on the issue of water and poverty and the *Human Development Report 2003* of the United Nations Development Programme (UNDP).

46. The United Nations also holds two yearly events: the International Day for the Eradication of Poverty, observed every year on 17 October, and World Food Day, observed annually on 16 October. Water availability and access issues are an integral part of the messages for both days.

Goal 2: Achieve universal primary education

By 2015, ensure that all boys and girls complete a full course of primary schooling

47. The main indicators for progress towards this Goal are:

(a) Net enrolment ratio in primary education;

(b) Proportion of pupils starting grade 1 and reaching grade 5;

(c) Literacy rate of 15- to 24-year-olds.

48. Improving the access of poor people to water has the potential to make a major contribution towards increasing children's, particularly girls', school attendance.

49. The main related challenges identified in the World Water Assessment Programme are: meeting basic needs and ensuring the knowledge base.

50. Additional related publications include: the annual *Global Monitoring Report* issued by the Education for All programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which assesses progress towards the education goals set by the international community, and the UNDP *Human Development Report*, which shows progress towards this goal in all countries.

51. The United Nations observes International Literacy Day every year on 17 October, and has declared the period 2003-2012 as the United Nations Literacy Decade. Water availability and access issues are an integral part of the messages for both days.

52. Approximately 113 million children of school age, some 60 per cent of which are girls, do not attend school. According to the *World Water Development Report*, water factors, such as the need to collect domestic water, play a large part in school attendance. School attendance, especially among girls, is affected by time-consuming water-carrying burdens and poor health. A lack of adequate sanitation facilities in schools also prevents girls from attending school, particularly when they are menstruating. Convenient access to clean water and improved sanitation facilities in schools not only gives children time and an appropriate environment, it also helps in the recruitment and retention of professional teachers.

Goal 3: Promote gender equality and empower women

Eliminate gender disparity in primary and secondary education, preferably by 2005, and at all levels by 2015

53. Two thirds of the world's illiterate are female, and the rate of employment of women is only two thirds that of men. It has been shown, however, that water-related enterprises, such as agricultural development projects, have a far greater success rate when women are involved than when they are excluded.

54. According to the *World Water Development Report*, many girls are prevented from attending school because they are in charge of collecting domestic water and because of the lack of separate toilet facilities in schools.

55. The main indicators for progress towards this Goal are:

(a) Ratio of girls to boys in primary, secondary and tertiary education;

(b) Ratio of literate females to males aged 15 to 24;

(c) Share of women in wage employment in the non-agricultural sector;

(d) Proportion of seats held by women in national parliaments.

56. The main related challenges identified in the World Water Assessment Programme are: meeting basic needs and ensuring the knowledge base.

57. Related publications include the UNDP *Human Development Report*, which shows progress towards this goal in all countries.

58. Related events include: International Women's Day, celebrated every year on 8 March.

59. Development practitioners agree that it is vital for women to be actively involved in all stages of community projects. With their detailed knowledge of local water sources, and as the main users of future water points, women are best placed to choose the ideal location. Women often take on the role of hygiene educators as they are able to talk to other women freely. Involving women in projects has a positive impact on women's position and status in the community.

Goal 4: Reduce child mortality by two thirds for children under five

60. Some 11 million children under the age of five die each year, mainly from preventable diseases. Children are the most hit by water-related diseases. According to the *World Water Development Report*, of all the people who died of diarrhoeal infections in 2001, 70 per cent (or 1.4 million) were children.

61. The main indicators for progress towards this Goal are:

(a) The under-five mortality rate;

(b) The infant mortality rate;

(c) The proportion of 1-year-old children immunized against measles.

62. The main related challenges identified in the World Water Assessment Programme include meeting the basic needs of children under five. Related publications include: *The State of the World's Children*, the annual report of the United Nations Children's Fund (UNICEF), which assesses the status of children around the world. A related event is World Health Day, celebrated every year on 7 April. Children are most vulnerable to the diseases that result from a lack of water, dirty water and poor sanitation. Diarrhoea is the biggest single killer of children in the developing world where 5,000 children die every day from water-related illnesses. Where development projects bring hygiene education, clean water and sanitation children's health improves. They also have time to go to school, gain an education, or simply to play.

Goal 5: Improve maternal health

By 2015, reduce by three quarters the maternal mortality rate

63. In developing countries, many of which have implemented safe motherhood programmes, 1 woman in 48 still dies during childbirth. Access to safe water and sanitation is essential in reducing the maternal mortality rate.

64. The main indicators for progress towards this goal are:

(a) The maternal mortality ratio;

(b) The proportion of births attended by skilled medical personnel.

65. During pregnancy, women in developing countries still have to collect water, and the lack of sanitation facilities means that it is not possible to maintain basic hygiene practices. After childbirth, women are often unable to wash themselves or the baby. Clean, accessible water and sanitation help women to minimize the chances of illness, or death, both for the baby and themselves.

Goal 6: Combat HIV/AIDS, malaria and other diseases

By 2015, halt and begin to reverse the spread of HIV/AIDS

66. Over a billion people in the world do not have access to safe water and over 2 billion lack adequate sanitation. Safe drinking water and basic sanitation help prevent water-related diseases, including deadly diarrhoeal diseases. Improved water management also reduces the risk of transmitting malaria and dengue fever.

67. Development research reveals that clean water and sanitation assist HIV/AIDS sufferers. People contracting water-related illnesses are very likely to have compromised immune systems, which may cause them to succumb more quickly to the HIV virus and develop AIDS-related illnesses. Conversely, those living with HIV will be less likely to be able to fight or to recover from water-related illness.

68. Worldwide, 40 million people are now infected with HIV/AIDS. Some countries, such as Brazil, have shown that the tide can be stemmed. People weakened by HIV/AIDS are likely to suffer the most from the lack of safe water supply and sanitation, especially since diarrhoea and skin diseases are two of the more common infections.

69. The main indicators for progress towards the Goal are:

(a) HIV prevalence among pregnant women aged 15 to 24;

(b) Ratio of condom use to other contraceptive methods;

(c) Number of children orphaned by HIV/AIDS.

By 2015, halt and begin to reverse the incidence of malaria and other diseases

70. Malaria is a water-related vector disease that kills more than 1 million people each year, 90 per cent of those in sub-Saharan Africa according to the *World Water Development Report*. The disease causes at least 300 million severe cases of illness annually, a number all the more striking since simple, effective solutions are available.

71. The main indicators for progress towards this Goal are:

(a) Prevalence and death rates associated with malaria;

(b) Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures;

(c) Prevalence and death rates associated with tuberculosis;

(d) Proportion of tuberculosis cases detected and cured under the Directly Observed Treatment Shortcourse (DOTS) programme.

72. The main related challenges identified in the World Water Assessment Programme are meeting basic needs and protecting ecosystems.

Goal 7: Ensure environmental sustainability

73. The target of Millennium Development Goal 7, to halve the proportion of people without access to water and sanitation, is the focus of much of the policy and operational work of the members and partners of UN-Water, many of whom have been working with local partner organizations to help people in the poorest countries gain access to water and sanitation by 2010.

74. This work is particularly focused in countries in sub-Saharan Africa and South Asia, which between them contain 30 per cent of the world's population without safe water and 40 per cent of the world's population without sanitation. Members and partners of UN-Water work with local counterpart entities to ensure that appropriate technology is used in, and training provided to, communities to create sustainable projects.

75. Another key part of the strategy followed is to ensure all future water supply and sanitation projects supported by the members and partners of UN-Water address the issues of water depletion and contamination through appropriate integrated water resource management.

By 2015, integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources

76. Environmental resources are at ever greater risk — since 1900, some 50 per cent of wetlands worldwide have been lost. Environmentally sound policies are needed to ensure the sustainability of our ecosystems.

77. The main indicators for progress towards this Goal are:

(a) The proportion of land area covered by forest;

(b) The ratio of areas protected to maintain biological diversity to surface area;

(c) Energy use (metric ton oil equivalent) per $1 of gross domestic product (GDP);

(d) Carbon dioxide emissions per capita and consumption of ozone-depleting chlorofluorocarbons;

(e) Proportion of the population using solid fuels.

By 2015, reduce by half the proportion of people without sustainable access to safe drinking water

78. One billion people lack access to safe drinking water, and 2.4 billion to adequate sanitation. To achieve this target, an additional 1.5 billion people will require access to some form of improved water supply by 2015, that is, an additional 100 million people each year (or 274,000/day) until 2015.

79. The main indicator of progress towards this Goal is: the proportion of the population (urban and rural) with sustainable access to an improved water source.

Achieve significant improvement in the lives of at least 100 million slum-dwellers, by 2020

80. According to UN-Habitat, almost 1 billion people now live in slums, mostly in the developing world where slum-dwellers account for 40 per cent of the urban population. This number could climb to 2 billion by 2020. Slums present a particular challenge, as they are rarely supplied with clean, safe water or adequate sanitation.

81. The main indicators for progress towards this Goal are:

(a) The proportion of the urban population with access to improved sanitation;

(b) The proportion of households with access to secure tenure (owned or rented).

82. The main related challenges identified by the World Water Assessment Programme include: protecting ecosystems; meeting basic needs; and water and cities.

83. Related publications include the Millennium Ecosystem Assessment reports on the intrinsic links between ecosystems and human well-being and the yearly report issued by the World Health Organization (WHO), which assesses the state of health around the world.

84. Related events include World Environment Day, celebrated every year on 5 June, and World Water Day, celebrated annually on 22 March.

Goal 8: Develop a global partnership for development

Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory

85. This Goal includes a commitment to good governance, development and poverty reduction — both nationally and internationally.

Address the special needs of the least developed countries

86. This Goal includes tariff- and quota-free access for exports from the least developed countries; enhanced debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance (ODA) for countries committed to poverty reduction. According to the *World Water Development Report*, achieving the Millennium Development Goal on drinking water supply coverage will represent a major expenditure in all countries,

requiring between $10 billion and $30 billion a year on top of the amount already being spent.

87. The main indicators for progress towards this Goal are:

(a) ODA received in landlocked countries as a proportion of their gross national incomes (GNI);

(b) ODA received in small island developing States as a proportion of their GNI.

Deal comprehensively with the debt problems of developing countries through national and international measures to make debt sustainable in the long term

88. Many developing countries now spend more on debt service than on social services, severely crippling their development capacity.

89. According to the *World Water Development Report*, during the last decade many Governments, preoccupied by debt and deficit reduction, have significantly reduced their expenditures on environment-related infrastructure and services.

90. The main indicators for progress towards this Goal are:

(a) The proportion of total developed country imports (by value, excluding arms) from developing countries and least developed countries, admitted free of duties;

(b) Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries;

(c) Agricultural support estimate for the Organization for Economic Cooperation and Development (OECD) countries as a percentage of their GNP;

(d) Proportion of ODA provided to help build trade capacity;

(e) Total number of countries that have reached their Highly Indebted Poor Countries (HIPC) Debt Initiative decision points and number that have reached their HIPC completion points (cumulative);

(f) Debt relief committed under the HIPC Initiative, in United States dollars;

(g) Debt service as percentage of exports of goods and services.

In cooperation with developing countries, develop decent and productive work for youth

91. The main indicator for progress towards this Goal is the reduction of the unemployment rate among 15- to 24-year-olds for each sex and in total.

In cooperation with the private sector, make available the benefits of new technologies, especially information and communications technology (ICT)

92. The main indicator for progress towards this Goal is:

(a) Number of telephone lines and cellular subscribers per 100 inhabitants;

(b) Number of personal computers in use and Internet users per 100 inhabitants.

93. Information and communications technology (ICT) can go a long way in enhancing capacity-building and knowledge in the water domain. According to the *World Water Development Report*, at present there are about 45,000 courses available internationally for online learning, including 30 in hydrology and water resources.

94. The main related challenges identified in the World Water Assessment Programme include: water and cities; meeting basic needs; valuing water; governing water; securing the food supply; and securing the knowledge base.

95. There is an urgent need for action, but all too often water and sanitation are overlooked in the global development agenda, despite being consistently cited as top priorities by communities themselves. Total global investments in water and sanitation would need to be doubled to meet the Millennium Development Goal targets of halving the proportion of people living without water and sanitation by 2015.

96. Members and partners of UN-Water address global water and sanitation problems by: undertaking projects to support national efforts to set up and manage water and sanitation systems, particularly in countries in Africa, Asia and the Pacific region, and communicating and advocating for policymakers, policy-shapers and development practitioners to adopt a more integrated approach to development that recognizes how water and sanitation are vital to poverty reduction.

97. In rural areas the most common technologies that members and partners of UN-Water recommend to national partners are hand-dug wells, tubewells or boreholes that reach groundwater resources. Where possible, the rehabilitation of existing wells that have fallen into disrepair is recommended, as it is more cost-effective than the construction of new wells. The wells are hygienically sealed and fitted with appropriate pumps that the communities are trained to maintain and service themselves, with help from engineers available for serious problems.

98. Where groundwater is inaccessible or in short supply, rainwater harvesting can be a viable alternative or supplementary source. Rainwater is generally collected from roofs, from where it is filtered and stored in tanks. In mountainous areas, springs can be protected and gravity flow systems are used to pipe water downhill to a network of storage tanks and tapstands.

99. In urban areas where there are existing piped water supplies, members and partners of UN-Water and their counterpart organizations often help national efforts to negotiate with local governments or water suppliers to extend the network into their areas and construct communal tapstands that can be managed by the communities themselves.

100. Once communities have access to safe water, sanitation and hygiene education, they can escape the water and sanitation poverty trap. Freed from the time-consuming chore of water collection and the misery of water-related disease, communities are better able to channel their time and energy into more productive activities and simple enjoyment of life. Women have more time to work to earn money, grow food and cook and care for their children, which boosts households' income, nutrition and health. Children have more time to help with domestic tasks or dedicate to their schooling, which improves their long-term prospects.

101. In addition, the stress on household finances may be lessened owing to a reduced need for medical care for water-related diseases. Families also report lower stress levels, increased status and self-esteem and increased ability to observe religious rites and customs.

V. The way forward

102. The final year of the "Water for Life" decade coincides with 2015, the milestone year for the achievement of the Millennium Development Goals. It is now clear that the present midterm review provides policymakers and policy-shapers in Member States with an opportunity to look beyond 2015 and to consider the deprived populations who were not covered by the Millennium Development Goals and those who were left out in countries that fell short of meeting the Goals.

103. Whatever the outcome of the 2010 summit on the Millennium Development Goals and the subsequent development of goals on poverty reduction adopted by the international community, Member States should consider specific, more ambitious goals for water and sanitation, goals that accommodate not only those deprived under the current goals, but also provide complete access to water and sanitation for all as one of the most economical, humane and effective means towards the achievement of broader development goals.

104. In setting goals for the midterm review of the Water Decade, it is necessary to take into consideration not only the progress achieved towards the Millennium Development Goals, and what is needed to accelerate that progress, but what additional measures should be taken to realize the holistic aspirations of the entire Millennium Declaration, which remain valid but unrealized a decade later.

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Water, climate change and disasters

Note by the Secretariat*

Summary

The present note is submitted pursuant to General Assembly resolution 64/198, in which the Assembly, inter alia, invited the President of the Assembly to convene a high-level interactive dialogue of the sixty-fourth session of the General Assembly in New York on 22 March 2010, World Water Day, on the implementation of the International Decade for Action, "Water for Life", 2005-2015. The note provides background information for Member States on water, climate change and disasters, selected as the theme of one of the round tables of the interactive dialogue.

Water is the primary medium through which climate change influences the earth's ecosystem and therefore people's livelihoods and well-being. Water-related climate change impacts are already being experienced in the form of more severe and frequent droughts and floods. Higher temperatures and changes in extremes are projected to affect availability and distribution of rainfall, snowmelt, river flows and groundwater and further deteriorate water quality. The poor, who are the most vulnerable, are likely to be adversely affected the most. Adaptation to climate change is mainly about water and sustainable development. Recognizing this and responding appropriately presents development opportunities. Various necessary adaptation measures to deal with climate variability, building upon known land and water management practices, have the potential to create resilience to climate change and enhance water security. Innovative technological practices and implementation of strategies are also needed at the appropriate scales, for adaptation as well as mitigation.

* The present note is based largely on a still unpublished UN-Water policy brief on water and climate change, which was prepared by the Task Force on Water and Climate Change of UN-Water, the inter-agency mechanism designated by the United Nations System Chief Executives Board for Coordination, through its High-level Committee on Programmes, as the coordinating mechanism in the United Nations system for follow-up action in the area of water and sanitation.

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The sense of urgency for climate change adaptation and the recognition of the central position of water have not yet permeated the political world and are often not reflected in national plans or international investment portfolios where adaptation measures in water management are underrepresented. Consequently, significant investments and policy shifts are needed. The present note provides some guiding principles for such policy shifts at the country, regional and international levels.

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I. Introduction

1. Water is the lifeblood of the planet and the state of the resource affects all natural, social and economic systems. It serves as the fundamental link between the climate system, human society and the environment. The hydrological cycle and therefore water management is already severely impacted by climate change. This is having significant effects on human development and security.[1]

2. Climate change has large impacts on both water resources availability and demand. It is critical to understand the processes driving these changes, the sequences of the changes and their manifestation at different spatial and temporal scales. It is likely to be an increasingly powerful driver of water availability, acting in combination with other drivers that are already having a serious impact on its quality and availability. Increased water-related risks associated with the changes in frequency and intensity of extreme events, such as droughts, floods, storm surges and landslides, will put further stresses on water resources management and increase uncertainty about quantity and quality of water supplies. This will continue regardless of the mitigation measures employed over the coming decades. Society needs to find ways to adapt to the changes that are expected, and to render its water infrastructure and services more resilient in coping with new conditions and extreme events.

3. Climate change is a complex problem which has brought increased appreciation of the need for an integrated, multisectoral and multidisciplinary collaborative response. Apart from the normal water domain, decision makers in other spheres (finance, trade, energy, housing, regional planning, agriculture, etc.) must utilize water efficiently. Sustainable management and development of water will have a pivotal role in preparing societies to adapt to climate change in order to increase resilience and achieve development goals. It calls for policy shifts, investments and changes in the way water issues are addressed in development strategies and budgets.

4. This policy paper is the product of the joint efforts of the members and partners of UN-Water and is addressed to the practitioners and policymakers of water resources management, the sectoral decision makers as well as the climate change policy shapers. The aim of the paper is to draw attention to the critical importance of better water resources management in adaptation to climate change. Water management should be systematically integrated into national plans and international investment portfolios for adaptation.

II. Climate change impacts

5. Water is the primary medium through which climate change influences the Earth's ecosystems and people's livelihoods and well-being. Global warming is likely to result in an intensification, acceleration or enhancement of the global

[1] M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson, eds., *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK, Cambridge University Press, 2007), 976 pp. Available from www.ipcc.ch/publications_and_data/ar4/wg2/en/contents.html.

hydrological cycle.[2] The changes in precipitation that higher average temperatures and temperature extremes are projected to cause will affect water resources availability through changes in form, frequency, intensity and distribution of precipitation, soil-moisture, glacier- and ice-snowmelt, and river and groundwater flows, and will lead to further deterioration of water quality. There is already evidence that this is happening in many regions. The global picture is complicated and uneven, however, with different regions, river basins and localities affected to different degrees, and in a variety of ways.

6. From the supply side, climate change directly affects the water cycle and, through it, the quantity and quality of water resources available to meet societal and ecosystem needs. It can result in higher-intensity precipitation causing greater peak runoffs but less groundwater recharge. Receding glaciers, melting permafrost and changes in precipitation from snow to rain are likely to affect seasonal flows. Longer dry periods are likely to reduce groundwater recharge, lower minimum flows in rivers and affect water availability, irrigated agriculture, drinking water supply, manufacturing and energy production, thermal plant cooling and navigation. Increased intensity of rainfall, the melting glacial ice and large-scale deforestation are increasing soil erosion and depriving top soils of nutrients. Changes to the proper functioning of ecosystems will increase loss of biodiversity and damage ecosystem services.

7. Rising sea levels will have a serious effect on coastal aquifers, which constitute a major source of water supply for many cities and other users.[2] They will have severe impacts on the food production in major delta regions which serve as the food bowl in many countries. This would also have a profound effect on coastal ecosystems, including loss in the productivity of estuaries, changes in barrier islands, wetland loss and increased vulnerability to coastal erosion and flooding.

8. Global warming is expected to have substantial effects on the flow of energy and the recycling of matter through its impact on water temperature. It is likely to result in algal blooms, increases in toxic cyano-bacteria bloom and reductions in biodiversity. The composition of water in rivers and lakes and its quality is likely to be impacted owing to changing precipitation and temperature resulting from climate change. At the same time, changes in precipitation intensity and frequency influence non-point source pollution. Climate change will make the management of waste water and water pollution more demanding and urgent.

9. Climate change will also directly affect demand for water, for instance, through changes in demands from industrial and household use or irrigation. Water demand for irrigation may increase as transpiration increases in response to higher temperatures. Depending on future trends in water use efficiency and the development of new power plants, the demand for water in thermal energy generation could either increase or decrease.

10. Extreme weather events have become more frequent and more extreme in many regions, resulting in an increase in the magnitude of water-related hazards. At the same time, demographic changes are exposing more people to the increased

[2] B. C. Bates, Z. W. Kundzewicz, S. Wu and J. P. Palutikof, eds., *Climate Change and Water*. Technical Paper VI of the Intergovernmental Panel on Climate Change (Geneva, IPCC secretariat, 2008), 210 pp. Available from www.ipcc.ch/publications_and_data/publications_and_data_technical_papers_climate_change_and_water.htm.

risks of flooding, cyclones and droughts. The impacts of recent major flooding, which has resulted in many deaths and has cost billions of dollars in damages, are an indication of what could lie in store from increased climatic variability in future.[3] At the opposite extreme, the more intense droughts seen in the past decade, affecting an increasing number of people, have been linked to trends in higher temperatures and decreased precipitation. In its Fourth Assessment Report, the Intergovernmental Panel on Climate Change has concluded with high confidence (90 per cent probability) that the extent of drought-affected areas will likely increase.[1]

III. Water resources management and climate change

11. Management of water resources impacts almost all aspects of society and the economy including food production and security, domestic water supply and sanitation, health, energy, tourism, industry and functioning of ecosystems. Under present climate variability, water stress is already high, particularly in many developing countries.[1] Managing water has always implied dealing with the natural variability in supplies and its impact on competing uses of water. Climate change threatens to intensify this variability, shifting and intensifying the extremes, and introduces greater uncertainty in the quantity and quality of supply over the long term. Adaptation to the current climate variability, while having direct benefits, can also help society to better prepare itself for the increased variability that is expected in the future.

12. Climate change is one of the basic drivers of change for water resources management, alongside demographic, economic, environmental, social and technological forces.[4] If conceived in isolation, solutions to the major challenges that these drivers create may become self-defeating. Keys to many water management problems are held by decision makers and policymakers in other disciplines. Recognizing water as "the lifeblood" implies that all major decisions, wherever they are taken, should factor in their potential impact on water. Decision makers, while tackling these issues, should think beyond their own sectors and consider the wider ramifications of their decisions on water availability and the forces affecting it. A balanced, integrated and coherent approach would require thinking outside the box.[4]

13. Improved management of water resources, together with land, is critical to sustainable development, especially in the context of worsening food security and malnutrition, increased energy shortages, the spread of diseases, humanitarian emergencies, growing migration, and increased risk of conflict over scarce land and water and escalating ecosystem degradation. Considering the increasing stresses that water scarcity will place on the environment, and the importance of water in development, mitigation of impacts of water management on the environment will become increasingly difficult. Country-specific solutions may include the creation of new decision-making mechanisms incorporating climate change impacts. This

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[3] United Nations Development Programme, *Human Development Report 2007/2008*, Fighting Climate Change: Human Solidarity in a Divided World (New York, UNDP, 2007). Available from http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf.

[4] World Water Assessment Programme, *The United Nations World Water Development Report*, third edition: *Water in a Changing World* (Paris, UNESCO, and London, Earthscan, 2009). Available from www.unesco.org/water/wwap/wwdr/wwdr3/.

may call for the establishment of new institutions and networks and for better coordination and exchange of information.

14. The world needs to adapt to climate change in water resources management. If improvements in water resources management are not addressed urgently and adequately, the progress towards poverty reduction targets, the Millennium Development Goals and sustainable development in all its economic, social and environmental dimensions will be jeopardized.

IV. Adapting to climate change

15. Policy in response to climate change has so far been dominated by the need for mitigation. Though these measures can slow climate change, they will not halt or reverse it within the foreseeable future. Since effects of climate change are inevitable in the short and medium term, adaptation needs to be addressed with the same urgency as mitigation. Adaptation, as embodied in the Nairobi Work Programme of the United Nations Framework Convention on Climate Change, relies on a better understanding of the impacts of climate change and making informed decisions on measures to cope with it. Water management, based on integrated and system-wide approaches, is key to climate change adaptation.

16. Adaptation planning and practices need to be comprehensive and flexible with cross-sectoral national climate change adaptation plans developed with water management as a pivotal consideration. At the same time, adaptation needs have to be considered in the context of a climate risk management framework to ensure sustainability of interventions.[5] Water-related disaster risk reduction should be considered as a tool in climate change adaptation with greater integration of water-related adaptation and disaster risk reduction strategies.

17. Long-term, sustainable adaptation to climate change will require integration of infrastructure, policy and economic instruments, as well as behavioural changes. Adaptation programmes should consider both structural and non-structural measures, the potential offered by both natural and physical infrastructure and "soft" programmes: positive inducements and negative sanctions. They should also be evaluated from the mitigation perspective. Efforts must be made to evaluate adaptation strategies for their likely impacts on the ecosystems services and health consequences. Adaptation measures should be built on learning-by-doing principles, particularly those being introduced locally that draw on traditional and indigenous knowledge, and could enrich the scientific knowledge base for application more widely.

18. Adaptation measures can be categorized in essentially five ways that water managers have of adapting to contemporary climate variability, and which ultimately will serve as the foundation to adapting to climate change:[6]

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[5] M. E. Hellmuth et al., eds., *Climate Risk Management in Africa: Learning from Practice* (New York, International Research Institute for Climate and Society, Columbia University, 2007).

[6] Eugene Stakhiv and Bruce Stewart, "White Paper: Needs for climate information in support of decision-making in the water sector". Paper produced for the Third World Climate Conference, 31 August-4 September 2009. Available from www.waterandclimate.org/UserFiles/File/WWW2009_Water Sector Needs-White Paper Ver 3_Numbered.doc.

- Planning and applying new investments, and capacity expansion (reservoirs, irrigation systems, levees, water supply, wastewater treatment, ecosystem restoration)
- Adjusting operation practices, monitoring and regulation of existing systems to accommodate new uses or conditions (e.g., ecology, pollution control, climate change, population growth)
- Maintenance and major rehabilitation of existing systems (e.g. dams, barrages, irrigation systems, canals, pumps, rivers, wetlands, etc.)
- Modifications in processes and demands (rainwater harvesting, water conservation, pricing, regulation, legislation, basin planning, payments for ecosystem services, stakeholder participation, consumer education and awareness) for existing systems and water users
- Introducing new efficient technologies (desalination, biotechnology, drip irrigation, wastewater reuse, recycling, solar panels).

Managing uncertainty

19. Uncertainty should not be allowed to be a reason for inaction. Adaptive management overcomes the challenges presented by uncertainties in various inputs to water management decision-making, including long-term climate projections. It allows adjustments to be made as more and better information is available. A pragmatic and "proactive adaptive management" approach, similar to the "no regrets" philosophy of climate change adaptation,[7] should be based on risk-based planning and design of infrastructure that accounts for climate uncertainties, and on the development of a new generation of risk-based design standards for infrastructure. Many non-structural measures are flexible and therefore more suitable for adapting to large uncertainty in both supply and demand and should therefore be integrated in every adaptation strategy. Adopting alternatives that perform well over a wider range of future scenarios could improve system flexibility. Adaptive management requires continuous feedback and adjustments based on the information provided by monitoring networks.

Managing increasing variability

20. Greater climatic variability and short-term uncertainty is likely to be superimposed on any long-term trend, thereby increasing the frequency of extreme events. This will call for comprehensive risk management, including disaster risk reduction at various levels, and adopting new technologies to develop improved early warning systems for improved reservoir and emergency operations. Water operators will need to take account of climate change predictions and uncertainties and prepare for the risks of more intense droughts and floods. Communities will need contingency plans for rapid and coordinated responses to floods and droughts. Demand management in the major user sectors can also improve resilience.

21. Creating the infrastructure for water resource development and distribution has been shown to have considerable human and macroeconomic benefits; conversely,

[7] Rasmus Heltberg, Paul Bennett Siegel and Steen Lau Jorgensen, "Addressing human vulnerability to climate change: toward a 'no regrets' approach", *Global Environmental Change*, vol. 19, issue 1 (February 2009), pp. 89-99.

countries lacking this capability suffer damaging shocks from droughts and floods.[4] More water storage is required to manage increased variability of water resources. Some of this can be natural — enhancing groundwater recharge through rainwater harvesting, sustainably managing aquifers and nourishing wetlands. Others can be man-made in terms of small, medium or large reservoirs, subject to safeguards for the environment and disrupted communities. Storage of both kinds will be required in many regions to insure against droughts and flooding, as well as to provide regular multi-purpose benefits.

Domestic water supply and sanitation

22. The world is on track to meet the Millennium Development Goal drinking water targets, but this is not the case for sanitation.[8] At the same time, water is increasingly under stress from competing demands and climate change, affecting both water quality and quantity. Adaptation calls for coherent measures to address water security for all major users with priority given to the basic needs of human hygiene, consumption and subsistence, which are uses defined as a human right.[9,10]. Increasing population, migration and rising living standards will put increased demand on water services. The existing water supply and sanitation infrastructure was historically designed for different resource availability and water use patterns. Such heritage infrastructure is likely to come under greater pressure owing to hydraulic changes and to warmer temperatures. Overcoming this deficit is an urgent issue that will facilitate adaptation to climate change. Storm-water and wastewater infrastructure would have to include climate change effects in their design and evaluation to improve performance under changing water availability, water demand and water quality conditions. A recent study of water supply and sanitation services shows that many are not resilient to climate change impacts.[11]

Agriculture

23. Climate change is expected to impact both rainfed and irrigated agriculture. Climate change will alter the distribution of agriculture across the globe, shifting potential to high latitude areas, while more frequent and severe droughts and floods will hurt subsistence agriculture in semi-arid zones at low latitudes, thereby worsening the living conditions of rural people who depend on agriculture for their livelihoods. Rural communities, particularly those living in already fragile environments, face an immediate and ever-growing risk of increased crop failure or loss of livestock and loss of fertile topsoil owing to increased erosion. The challenge

[8] World Health Organization and United Nations Children's Fund, Joint Monitoring Programme for Water Supply and Sanitation, *Progress on Drinking Water and Sanitation. Special Focus on Sanitation* (New York, UNICEF, and Geneva, WHO). Available from www.who.int/water_sanitation_health/monitoring/jmp2008/en/index.html.

[9] United Nations, Committee on Economic, Social and Cultural Rights, "General Comment No. 15 (2002), The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights"), 20 January 2003 (E/C.12/2002/11). Available from: www.unhcr.org/refworld/docid/4538838d11.html.

[10] Office of the United Nations High Commissioner for Human Rights, Position Paper, "Climate Change and the Human Right to Water and Sanitation", 2009. Available from: www2.ohchr.org/english/issues/water/Iexpert/docs/ClimateChange_HRtWS.pdf.

[11] World Health Organization and the Department for International Development, *Vision 2030: The Resilience of Water Supply and Sanitation in the Face of Climate Change* (Geneva, WHO, 2009). Available from www.who.int/water_sanitation_health/vision_2030_9789241598422.pdf.

is to increase the ability of the rural population to cope with climate change impacts through enhanced resilience and preparedness.

24. Several densely populated farming systems in developing countries are at risk from the impacts of climate change. Severe reductions in river runoff and aquifer recharge are expected in the Mediterranean basin and in the semi-arid areas of Southern Africa, Australia and the Americas, affecting water availability in already stressed regions. The large contiguous areas of irrigated land associated with river deltas are at risk from a combination of reduced inflows, change in annual flood cycles, increased salinity and sea-level rise. In irrigation systems that rely on high mountain glaciers for water, high runoff periods will advance to earlier spring, when irrigation water demand is still low. In addition, rising temperatures will increase crop water demand. Much more needs to be done to address water shortages with an integrated supply and demand-side management, including increased water storage infrastructure (surface water and groundwater), watershed development, rainwater harvesting, water conservation and a host of community initiatives, with a much better integration of land and water management.[12]

Water and health

25. Climate change will influence human health through water-related impacts of various kinds.[13] Changes in the composition of aquatic ecosystems will impact the nutritional status, and exposure to health risk and access to health services for communities whose livelihoods are closely tied to such ecosystems. The occurrence of opportunistic invaders in particular, such as cyanobacteria in lakes and reservoirs, will pose new challenges for water service companies. There has been a resurgence of water-related vector-borne diseases in areas where eradication programmes historically have been successful, and the emergence of new vector-born diseases in areas where they were previously unknown (e.g., chikungunya virus transmission in Italy and the continuing spread of dengue). While it is difficult to identify different driving forces, the role of climate change cannot be excluded. Reduced nutrition and access to safe water for human consumption and personal hygiene may compromise basic human health, and in particular affect the health burden owing to diarrhoeal diseases. Malnutrition because of water shortages, and in availability of safe drinking water during flooding caused by extreme rainfall events, may induce outbreaks of water-related diseases. New breeding places for mosquitoes and other disease-transmitting insects may develop. Groundwater resources may also need improved protection against contamination from extreme rainfall events and floods.

26. Nevertheless, climate change also brings opportunities to improve community health. These health benefits could offset some of the costs of climate change mitigation and adaptation. It is important to raise awareness among stakeholders of the nature and scope of these health benefits.[14]

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[12] Danish Ministry of Foreign Affairs and Partners, "Nairobi Principles in the 'Dialogue on Land and Water Management for Adaptation to Climate Change'", 2009. Available from www.landwaterdialogue.um.dk.

[13] Bettina Menne, Franklin Apfel, Sari Kovats and Francesca Racioppi, eds., *Protecting Health in Europe from Climate Change* (WHO Regional Office for Europe, 2008). Available from www.euro.who.int/Document/E91865.pdf.

[14] *The Lancet*, Executive Summary for the Lancet Series on Health and Climate Change (London, 2009). See http://press.thelancet.com/ccexec.pdf and http://www.wellcome.ac.uk/climatechange.

Ecosystems

27. The services provided by ecosystems underpin livelihoods and economic development. Impacts of climate change on water will aggravate drivers of ecosystem degradation, reducing the benefits people obtain from them, such as supply of clean water, fisheries and coastal defences. The impacts of climate change on ecosystems will increase the vulnerability of people. Thus, actions to reduce and restore ecosystems and their services will help to reduce community vulnerability and build community and national-level resilience. Such actions include upper watershed management to maintain water storage, allocation of water to ecosystems through application of environmental flows, and restoration of floodplains and mangroves. To maximize benefits for resilience, these should be complemented by effective, participatory water governance implemented through adaptive institutions.

Water-related hazards

28. Society needs to adapt to the full range of water-related hazards that will accompany climate change. These can result from too much water (causing floods, erosion, land- and mud-slides, etc., in land-degraded areas) or too little (droughts, forest fires, loss of wetlands or other habitats, saline encroachment, etc.) and from the effects of chemical and biological pollution on water quality and in-stream ecosystems. Approaches, such as Integrated Flood Management,[15] which are robust and adaptive should be adopted to manage floods. Flood risk assessment, which forms an essential element in such approaches should incorporate climate change impacts on the magnitudes and vulnerability of floods.[16] Early warning for droughts is essential, especially for the large regions of rainfed agriculture. The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters[17] provides the internationally agreed framework for reducing disaster risks and is widely acknowledged as an important tool for adaptation to climate change.

29. Agreed at the World Conference on Disaster Reduction in January 2005, in Kobe, Japan, by 168 Governments, the expected outcome of the Hyogo Framework for Action is "the substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries".[18] The Framework specifically identifies the need to "promote the integration of risk reduction associated with existing climate variability and future climate change into strategies for the reduction of disaster risk and adaptation to climate change".[19]

30. The Hyogo Framework sets out five priorities for action,[20] each elaborated into a number of specific areas of attention. These offer a strong basis for developing concrete risk-reducing adaptation measures, as follows:

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[15] Associated Programme on Flood Management, *Integrated Flood Management Concept Paper* No. 1047 (WMO, 2009). Available from www.apfm.info/pdf/concept_paper_e.pdf.

[16] European Commission White Paper, "Adapting to Climate Change: towards a European framework for action" (Brussels, 2009). Available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF.

[17] A/CONF.206/6 and Corr.1, chap. I, resolution 2. Available from http://www.unisdr.org/eng/hfa.htm.

[18] Ibid., para. 11.

[19] Ibid., para. 19 (i) (c).

[20] Ibid., para. 14.

1. **Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation**. This need is critical to both adaptation and risk reduction. Suggested actions towards achieving this priority include: encouraging a core ministry with a broad mandate including finance, economics or planning, to be responsible for mainstreaming climate change adaptation policies and activities; organizing a national high-level policy dialogue to prepare a national adaptation strategy that links with disaster risk reduction strategies; formalizing collaboration and the coordination of climate-related risk reduction activities through a multisector mechanism such as a national platform for disaster risk reduction; and developing mechanisms to actively engage and empower women, communities and local governments in the assessment of vulnerability and impacts and the formulation of local adaptation activities.

2. **Identify, assess and monitor disaster risks and enhance early warning**. Important steps under this priority include developing and disseminating high-quality information about climate hazards and their likely future changes; conducting assessments of vulnerability and specially vulnerable groups; preparing briefings for policymakers and sector leaders; reviewing the effectiveness of early warning systems; implementing procedures to ensure that warnings reach vulnerable groups; and undertaking public information programmes to help people to understand the risks they face and how to respond to warnings.

3. **Use knowledge, innovation and education to build a culture of safety and resilience at all levels**. This principle applies equally to adaptation and disaster risk reduction. Specific steps should include collating and disseminating good practices; undertaking public information programmes on local and personal actions that contribute to safety and resilience; publicizing community successes; training the media on climate-related issues; developing education curricula on climate adaptation and risk reduction; supporting research programmes on resilience; and improving mechanisms for knowledge transfer from science to application for risk management in climate-sensitive sectors.

4. **Reduce the underlying risk factors**. This covers the many environmental and societal factors that create or exacerbate the risks from natural hazards. Measures can include incorporating climate risk-related considerations in development planning processes, macroeconomic projections and sector plans; requiring the use of climate risk-related information in city planning, land-use planning, water management, and environmental and natural resource management; strengthening and maintaining protective works such as coastal wave barriers, river levees, floodways and flood ponds; requiring routine assessment and reporting of climate risks in infrastructure projects, building designs and other engineering practices; developing risk transfer mechanisms and social safety nets; supporting programmes for diversification of livelihoods; and instituting adaptation activities in plans for recovery from specific disasters.

5. **Strengthen disaster preparedness for effective response at all levels.** Actions include revising preparedness plans and contingency plans to account for the projected changes in existing hazards and new hazards not experienced before; building evacuation mechanisms and shelter facilities; developing specific preparedness plans for areas where settlements and livelihoods are under threat of permanent change; and supporting community-based preparedness initiatives. Resilience-building and early warning systems also contribute to this priority.

V. Guiding principles

A. Mainstreaming adaptation within the broader development context

31. Adaptation must be addressed in a broad development context, recognizing climate change as an added challenge to reducing poverty, hunger and diseases and reversing environmental degradation. For adaptation measures to be effective they must be integrated into national development plans, promoting synergies as the poor and marginalized groups are most vulnerable to the impacts of climate change, and suffer the most from accelerating water scarcity, water quality degradation, floods and droughts, and sea-level rise. Policy changes for promoting synergies between adaptation and existing development challenges such as food security, poverty reduction, disaster risk reduction and environmental protection that are closely linked with effective water management need to be identified and implemented.

32. Effective adaptation not only requires that water is at the heart of national climate change adaptation strategies, but also that existing national water policies, plans and funds mainstream climate change adaptation.

33. Managing the competing demands for water from various sectors will become more onerous in conditions of water scarcity and drought. Different interests (water supply, sanitation, agriculture, irrigation, hydropower, navigation/transportation and environment) fashion their own set of management principles, rules and incentives that are often in conflict with one another. Cross-sectoral, integrated and system-wide approaches to climate change adaptation must be developed, with water management recognized as central to any development plans.

B. Strengthening water governance and the integration of land and water management

34. Effective adaptation for water requires different approaches within a comprehensive, integrated framework, where bottom-up meets top-down — from community-based adaptation in the villages to the basin, national and regional/transboundary levels. Water and climate do not respect borders and many adaptation measures will have impacts on neighbouring countries. This calls for cooperative solutions that help to prevent negative effects of unilaterally taken adaptation measures and identify more holistic solutions. Many countries have embarked on water sector reforms based on Integrated Water Resources Management approaches,[21] employing a variety of tools based on multidisciplinary

[21] Global Water Partnership, "Strategy 2009-2013", 2009.

inputs, public participation and regulatory, financial and policy incentives. Well-functioning institutions are needed to effectively administer this broad array of fairly complex combinations of management measures.

35. In order to incorporate climate change adaptation within the governance of water resources, mandates and management functions may need to be clarified and institutions strengthened at various levels. Adaptive water governance will call for more intersectoral planning and linkages between institutions responsible for agriculture, forestry, energy, the environment and water.[22] The role of water in climate change adaptation should be mainstreamed into the work of all ministries.[12] All development projects need to be resilient, and all adaptation measures need to be assessed for inadvertent adverse effects on the environment and on human health, to avoid maladaptation.

36. Strengthening institutions and building capacities for land and water management is crucial for effective adaptation, building on the principles of participation of civil society, equality and decentralization.[22,12] Creation of authorities based on hydrological rather than political boundaries and more effective regional water institutions and improved transboundary cooperation will be required.[23] Stronger, accountable institutions will be able to plan and adjust to changes in water availability and extreme water events.

37. Despite the considerable uncertainty and large potential range in local climate change predictions, deliberate and constructive decisions can still be taken. Lessons can be learned from drought and flood experiences of the past to reduce the vulnerability of newly affected areas in the future. Strengthening resilience and capacity to manage today's climate is often an appropriate response to future climate change threats.

C. Improving and sharing knowledge and information

38. Sound water management is built upon long-term hydrological and climate information gathered through monitoring networks that provide accurate, timely and consistent data. Meeting the challenge of climate change is made more daunting as information about the status of availability and use of water and the potential impact of climate change is often very limited for informed decision-making. Hydrological monitoring networks are on the decline.[24] Hydrological information is often partial, unreliable, inaccessible or simply lacking at relevant levels — global, regional, national and sub-national. Even the data that exists is not efficiently used. There is little sharing of hydrologic data, owing largely to limited physical access, policy and security issues, lack of accepted protocols for sharing and, often, commercial considerations.

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[22] Mannava V. K. Sivakumar and Robert Stefanski, "Climate and land Degradation — an Overview", in Mannava V. K. Sivakumar and Ndegwa Ndiang'ui, eds., *Climate and Land Degradation* (chap. 6) (Hamburg, Springer-Verlag, 2007).

[23] United Nations Economic Commission for Europe, Convention on the Protection and Use of Transboundary Watercourses and International Lakes: *Guidance on Water and Adaptation to Climate Change* (Geneva, UNECE, 2009). Available from www.unece.org/env/water/publications/documents/Guidance_water_climate.pdf.

[24] World Water Assessment Programme, The Second United Nations World Water Development Report: *Water: a shared responsibility*, 2006. Available from www.unesco.org/water/wwap/wwdr/wwdr2/.

39. Transboundary cooperation in the development of adaptation strategies can bring mutual benefit for all riparian parties — for example, by reduced uncertainty through exchange of data and information. Transboundary cooperation can widen the knowledge/information base, enlarge the set of available options for prevention, preparedness and recovery and thereby help to find better and more cost-effective solutions.[23]

40. No individual water management agency and affiliated research institute can deal with the problem of developing a suite of new principles and tools that water managers and design engineers can use effectively to adapt to climate change. An internationally coordinated, collaborative applied research and development effort needs to be undertaken that routinely deals with practical implementation issues for water management.[6]

41. Better access to information promotes more rational decision-making. As most decisions on adaptations in the water domain would have to be made at basin and local level, accurate, consistent, timely and relevant information about water and climate should be widely available. Information and knowledge for local adaptation must be improved, and must be considered as a public good to be shared at all levels. Better information, communication and public awareness, reinforced by the right incentives and sanctions, are required to produce changes in the behaviour of water users to complement other measures.

D. Building long-term resilience

42. Owing to future uncertainties, the keystone for adaptation must be resilience — managing risks and building the capacity to deal with unpredictable events. Building resilience to ongoing and future climate change calls for adaptation to start now by addressing existing problems in land and water management. Climate change impacts are already beginning to be felt and we need to act today, through context-specific adaptation measures, to be prepared for an increasingly uncertain future.

43. Water management options, including operational changes, demand management and infrastructure changes, facilitate adaptation to climate change. Decision-making frameworks using robust solutions should be encouraged. Multidisciplinarity, multisectoral collaborations and adaptive management require building capacity, both institutional and human, at various levels. The planning and design of new hydraulic infrastructure in addition to new hydrologic tools also calls for a new socio-economic decision framework.

44. Climate change is widely perceived as a threat rather than an opportunity, yet there may be overall benefits to health and development in adapting to climate change. There is a potentially high adaptive capacity in many water and sanitation services, but this potential is rarely fully achieved. Systematic assessments of the climate change resilience of all utilities and of rural water and sanitation programmes are needed.[11] Urgent action is required to turn the potential adaptive capacity of many utility-managed water supplies to actual resilience to climate change.

45. Focusing on the adaptive capacity for livelihoods and ecosystem maintenance, and building on integrated land and water resources management approaches, "no regrets" investments are needed for both hard and soft adaptation measures. These

include increased water use efficiency and water storage capacity, intensification and diversification in agriculture, and sustainable ecosystems.[25,26]

E. Cost-effective adaptive water management and technology transfer

46. Infrastructure must be designed to cope with climate uncertainty. Climate adaptation is value for money in terms of economic cost benefits (in terms of damages avoided). Furthermore, "soft" infrastructure such as watershed and wetlands should be assessed as viable alternatives to "hard" infrastructure such as dams or canals.

47. Cost-benefit analysis of adaptation actions should take note of all potential benefits, especially health-related ones. Experience in the area of drinking-water supply and human health has shown that a narrow perspective, such as that adopted in the early 1980s for so-called selective primary health care, fails to support a long-term goal. Recent studies by the World Health Organization have demonstrated that by taking all co-benefits into account (through a social cost-benefit analysis), returns of up to US$ 34 can be achieved for every US dollar invested in drinking-water supply. Analyses of a similar scope, including health co-benefits, should be carried out on adaptation measures aimed at strengthening the resilience of hydraulic infrastructure.

48. Technological advances for improving irrigation efficiency, use of lower quality water (including reclaimed wastewater), reduction of system losses from water systems, and other developments indicate considerable potential for conserving existing water supplies and making better use of what is available. These technologies, appropriately adapted to local conditions, must be facilitated and the capacity to implement and operate them supported.

F. Additional and innovative funding

49. The costs of inaction are high. The economic and social benefits of adaptation, require increased and innovative investment and financing. Improving adaptive capacity calls for more intelligent use of existing financing, targeted towards the most exposed groups. The full range of financing options needs to be utilized, including innovative financing mechanisms, private sources and public funding from developed countries.

50. Developing countries currently lack effective funding mechanisms to support adaptation to climate change. More funding must be made available if adaptation strategies are to become sustainable. There is a need for increased support for adaptation actions through targeted financing and improved aid effectiveness. As such, any adaptation funds must be new and additional to existing official development assistance in recognition of the compensatory nature of such funds.[27]

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[25] John H. Matthews and Tom Le Quesne, *Adapting Water Management: A Primer on Coping with Climate Change*, World Wildlife Fund, Water Security Series 3, 2009. Available from www.worldwildlife.org/climate/Publications/WWFBinaryitem12534.pdf.

[26] International Union for Conservation of Nature, "Environment as Infrastructure — resilience to climate change impacts on water through investments in nature", 2009.

[27] Commission on Climate Change and Development, *Closing the Gaps: Disaster risk reduction and adaptation to climate change in developing countries* (Ministry of Foreign Affairs, Stockholm, 2009). Available from www.ccdcommission.org/Filer/report/CCD_REPORT.pdf.

Access to existing adaptation funds should provide funding for adaptation across the board for all sectors concerned. Sound land and water management practices that provide mitigation and/or adaptation benefits should be eligible for such financial support. There is a need to prioritize the water-related projects in adaptation funding. Climate change adaptation should be integrated into existing funding streams for water management, and adaptive water management should be considered as a funding priority for other water-reliant sectors.

51. Development budgets are already under high pressure from the global financial and economic crisis. There is a need to influence and ensure the development of financing mechanisms capable of generating sufficient resources and delivering them in a manner that minimizes complexity and supports the integration of adaptation concerns into the broader development agenda.

VI. Conclusions and recommendations

52. **Climate change manifests itself through water resources. Its management impacts almost all aspects of society and the economy. Water-related climate change adaptation has a pivotal role in achieving sustainable development.**

53. **The sense of urgency for climate change adaptation and the recognition of the central position of water have not yet permeated the political world and are often not reflected in national plans. Significant investments and policy shifts are needed. These should be guided by the following principles:**

(a) **Mainstreaming adaptations within the broader development context;**

(b) **Strengthening water governance and improving water management;**

(c) **Improving and sharing knowledge and information on climate and adaptation measures, and investing in data collection;**

(d) **Building long-term resilience through stronger institutions, and investment in infrastructure and well-functioning ecosystems;**

(e) **Investing in cost-effective and adaptive water management as well as technology transfer;**

(f) **Leveraging additional funds through both increased national budgetary allocations and innovative funding mechanisms for adaptation in water management.**

54. **Application of these principles would require concerted efforts and global to local-level collaborations among various sectoral, multisectoral as well as multidisciplinary institutions.**

55. **Responding to the challenges of climate change impacts on water resources requires regional, national and local-level adaptation strategies. Countries are urged to improve and consolidate their water resources management systems and to identify and implement "no regrets" strategies which have positive development outcomes that are resilient to climate change.**

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Agenda item 39
Implementation of the Declaration on the Granting of Independence to Colonial Countries and Peoples

Report of the Special Committee on the Situation with regard to the Implementation of the Declaration on the Granting of Independence to Colonial Countries and Peoples

Membership of the Special Committee

Rapporteur: Bashar **Ja'afari** (Syrian Arab Republic)

1. At the 1st meeting of the Special Committee, on 25 February 2010, the Chair drew attention to the letter dated 1 October 2009 from the Permanent Representative of Nicaragua to the United Nations addressed to the Chair of the Special Committee (A/AC.109/2010/1) and the draft decision submitted by the Chair (A/AC.109/2010/L.3).

2. At the same meeting, statements were made by the representatives of Cuba, Dominica, Venezuela (Bolivarian Republic of), Indonesia, the Syrian Arab Republic, the Congo, Ecuador, Bolivia (Plurinational State of), Grenada, Tunisia and the Russian Federation (see A/AC.109/2010/SR.1).

3. Also at that same meeting, the Special Committee adopted draft decision A/AC.109/2010/L.3 without a vote.

Recommendation

4. The Special Committee recommends to the General Assembly the adoption of the following draft decision:

Increase in the membership of the Special Committee on the Situation with regard to the Implementation of the Declaration on the Granting of Independence to Colonial Countries and Peoples

The General Assembly decides to increase the membership of the Special Committee on the Situation with regard to the Implementation of the Declaration on the Granting of Independence to Colonial Countries and Peoples from twenty-eight to twenty-nine and to appoint Nicaragua as a member of the Committee.

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